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ABSTRACT

The relationship between test anxiety and performance on oral comprehensive examinations was studied, with special attention to the repressor phenomenon. Repressors are persons who report low anxiety, but are actually more stressed than are low anxious subjects, as evidenced on measures not relying on self-report. Subjects were 42 female graduate students pursuing a master's degree in nursing. The majority (37 of 42) had participated in a previous study of anxiety classifying them as high anxious, repressors, or truly low anxious. In addition to the anxiety rating from the larger study, four instruments were used: the Test Anxiety Scale, Student Climate, Performance on Oral Comprehensives, and Committee Climate. The correlation of test anxiety with performance on oral comprehensive examinations was not significant. Performance was correlated with student perception of anxiety and negatively correlated to age. The strongest relationship was found between age and performance, with greater age associated with lower performance. Repressors, identified via use of the typology of D. A. Weinberger et al. (1979), reported less test anxiety than either high anxious or truly low anxious subjects. With repressors removed from the data set, the correlation of test anxiety and performance was significant. These findings illustrate the difficulty in using self-reports to identify anxious persons and in assuming that test anxiety does not influence performance. One figure and a 30-item list of references are included. (Author/SLD)

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Title: The Relationship of Test Anxiety and Performance in Oral Comprehensive Exams

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The Relationship of Test Anxiety and Performance in Oral Comprehensive Exams

Abstract

This study sought to evaluate the relationship of test anxiety with performance on oral comprehensive exams. The correlation of test anxiety with performance was not significant ($r=-.21$), student's perception of anxiety, however, was ($r=.46$, $p<.01$). Performance was correlated with student perception of anxiety ($r=.36$, $p<.01$), and with age ($r=-.49$, $p<.001$). Using Weinberger's anxiety typology to identify repressors (high anxiety types who do not admit anxiety), repressors reported less test anxiety than either high anxious or truly low anxious students. With repressors removed from the data set, the correlation of test anxiety and performance was significant. This finding indicates a difficulty in using self-report to identify anxious persons and in assuming test anxiety does not influence performance.

The Relationship of Test Anxiety and Performance in Oral Comprehensive Exams

Introduction

This study examined test anxiety in graduate students as it related to performance on oral comprehensive examinations with special attention to the repressor phenomenon. Repressors are persons who report low anxiety but on measures of anxiety that are not dependent on self report have been found to be more stressed than low anxious subjects (Weinberger, Schwartz, & Davidson, 1979). It was hypothesized that the presence of repressors might obscure the true relationship between test anxiety and performance.

Literature Review

Numerous studies (Hembree, 1988; Holroyd, Westbrook, Wolf & Badhorn, 1978; I.G.Sarason, 1958, 1959, 1961, 1963; S.B.Sarason & Mandler, 1952) have established a negative correlation between test anxiety and intellectual performance. However, other studies (e.g., Barnes, 1987) have indicated no significant relationship. Insufficient information on the performance ratings used in that study prohibits estimating the power of the analysis. Correlational studies have tended to find slight negative relationships between measures of general anxiety and intellectual performance (Gordon & S.B.Sarason, 1955; Mandler & S.B.Sarason, 1952; Spielberger, 1966; Spielberger & Katzenmeyer, 1959; Spielberger & Smith, 1966). Some studies have indicated an inverse relationship between degree of anxiety or arousal and complex performance (Duffy, 1957; Jenness, 1962; Malmo, 1957; I.G.Sarason, 1963). In easy cognitive tasks, persons with high anxiety demonstrate superior performance but in complex learning tasks low anxious subjects do better (Spielberger, 1975). In experimental studies, however, no significant causal association has been found (Allison, 1970; Chambers, Hopkins, & Hopkins, 1972; French, 1962; Silverstein, Mohan, Franken, & Rhone, 1964).

If Lader's (1983) general model of anxiety is applied to test anxiety, a student, drawing from genetic endowment and past experience, would perceive the test as stimulus, and appraise it for potential danger. It is theorized that all persons experience some amount of arousal or anxiety in anticipating a test. If the stimulus is perceived as a threat, the arousal process ensues. Peripheral physiological changes accompany fear. This model does not explain why some persons develop spontaneous pathologic anxiety; pathologic, in this sense, as interfering with performance.

Since the 1940's educators have been concerned about the influence of anxiety on student performance. Hembree (1988)

reported 18 mean correlations drawn from a categorization of 273 studies correlating paper and pencil test anxiety and aptitude/achievement measures. These ranged from -.06 to -.29 with a mean of -.18. Virtually no work has been done with oral exams (Mann & Dancey, 1968). Test anxiety studies (Barnes, 1987; Covington & Omelich, 1987; Gordon & S.B.Sarason, 1955; Mandler & S.B.Sarason, 1952; Paul & Ericksen, 1964; I.G.Sarason, 1975; Wine, 1971) have postulated the central problem as an inhibition of appropriate test taking behaviors and a concomitant emission of self-centered interfering responses. Several studies (e.g. I.G.Sarason, 1975) also postulate for some subjects a history of experience of nonsuccess in test taking such that tests become signals of punishment or nonreward.

Spielberger (1966) distinguished state anxiety, which consists of feelings of apprehension and heightened autonomic nervous system activity that varies in intensity and fluctuates over time, from trait anxiety, which refers to individual differences in anxiety proneness; i.e., to differential tendencies among individuals to respond with different levels of state anxiety in situations that are perceived as threatening. Test anxiety is perceived as trait anxiety.

A weakness of all self-report instruments measuring state or trait anxiety is their inability to differentiate between persons who are repressors and those who are truly low anxious. Repressors are commonly defined as persons who exhibit heightened recognition thresholds for the feelings of anxiety or stress and who consistently minimize disturbing cognitions regarding these feelings across a variety of perceptual, projective, and learning tasks (Weinberger et al., 1979). Weinberger et al. (1979), responding to the issue of the validity of self-report anxiety measures, developed a new method for identifying repressors. They used the Marlowe-Crowne Social Desirability Scale (SDS) (Crowne & Marlowe, 1960) and the Taylor Manifest Anxiety Scale (MAS) (Taylor, 1953) to discriminate truly low-anxious persons from repressors. Based upon a subject's score on each instrument in relation to the mean for the instrument, a subject is classified as either: (1) Low Anxious (below both the MAS median and the SDS upper quartile); (2) High Anxious (above the MAS median and below the SDS upper quartile); or (3) Repressor (below the MAS median and above the SDS upper quartile). Persons who score above the mean on both instruments are rare. Failure to distinguish repressors from the low anxious may be why some have found no relationship between psychometric and physiological measures of test anxiety (Chambers et al., 1972).

METHOD

Sample: All masters students in nursing who were completing the program between Fall 1986 and August 1987 were sent letters inviting

participation in the study. Forty two out of the 57 solicited (74%) responded, agreeing to participate. All participants were females. There were no significant differences between participants and nonparticipants in age (32.7 vs 34.4, p=.44), GPA (3.18 vs 3.24, p=.51), GRE (985.4 vs 984.7, p=.98) or in program emphasis. The majority of the subjects (37 out of 42) were also participants in a larger federally funded study examining anxiety. Measures of that study, based on Weinberger et al. (1979) resulted in the anxiety typology for all subjects identifying subjects as high anxious, repressors, or truly low-anxious in coping style. The 37 were divided into 13 high anxious, 11 truly low-anxious and 13 repressors.

Instruments: In addition to the anxiety rating from the larger study, four instruments were used: Sarason's Test Anxiety Scale (modified for application to oral comprehensives), Student Climate (student perception of the comprehensive climate), Performance on Oral Comprehensives, and Committee Climate (faculty panel perception of the comprehensive committee). The latter three were developed by the investigators. All four of these instruments were used in a pilot study (n=31) and refined following the pilot for use in the study.

Sarason's Test Anxiety Scale (TAS) is a paper and pencil true/false instrument. The language was modified to make reference to oral exams and items not appropriate for graduate students (e.g. intelligence test items) were deleted. Since test anxiety is understood to be a trait anxiety, subjects could complete the test at their convenience. Subjects were assured that the results would have no bearing on the result of the comprehensive exam but that information gained might be useful in future decisions about the nature and use of comprehensives. Internal consistency reliability (Cronbach's alpha) for the modified instrument as determined in this study was .785. The maximum possible score for test anxiety was 17. Higher scores indicate reported greater anxiety. The range of the group tested was 2 to 16 (mean=7.7, s=3.6).

The Student Climate instrument has 14 items with a 5 point Likert scale ranging from very tense (1.0) to very comfortable (5.0). An example of a stem is: The verbal responses of the committee made me . . . . The total score possible was 70. A higher score indicates greater comfort with the oral examination environment. The student completes the instrument immediately following the exam and before learning the result. The mean for the 42 subjects was 51.8 (s=9.2).

The Performance on Oral Comprehensives instrument has four criterion areas: Articulation of Appropriate Content Knowledge, Articulation/Clinical Application of Theory and/or Research, Organization of Material in Responses, and Presence/Style/Manner.

Each is rated on a scale of 1.0 (Poor) to 3.0 (Average) to 5.0 (Excellent). Each subject received an independent rating from each of the three members of the oral examinations committee. The mean average score obtained for the 42 subjects was 4.8 (s=.92). Despite instructions to use the full range of the instrument, scoring by committees did not discriminate well.

Finally, a Committee Climate scale was developed. A panel of three faculty members, familiar with the members of the comprehensive committees and their styles in the comprehensive exams, independently rated each subject's committee on a scale of one to five (low to high anxiety generating). An average score was calculated for each student's committee (mean=3.38, s=.57).

Procedures: After agreeing to participate, subjects completed the TAS at their convenience (since test anxiety is perceived to be a trait anxiety it can be measured at any time) and indicated the scheduled time and location of their oral comps. Subjects completed the Student Climate instrument during the period when the student was excused so the Committee could deliberate on the result. Members of the Committee independently completed the Performance on Oral Comprehensives instrument also at that time and before any discussion of the student's performance. At the end of the semester, the faculty panel used the Committee Climate instrument to judge the anxiety generating level of the committees for that semester.

Results:

A correlation matrix of the variables is included as Figure 1. Correlations for the entire group and then for the group remaining when repressors are removed are given. The correlation between the TAS scores and the performance scores for all 42 subjects was -.21 (.95CI=-.49,.11) very similar to Hembree's (1988) findings for written tests. The negative value indicates that higher test anxiety is associated with lower performance. The null hypothesis in this case was held tenable. However, the power of the test was limited by the small n. The presence of an outlier may also have weakened the relationship.

For the 37 subjects for whom anxiety typology was known and performance scores were available, there was not a significant difference in performance among the high-anxious, truly low-anxious, and repressors. The mean performance scores were: high-anxious, 4.64 (n=13); truly low-anxious, 4.91 (n=11); repressors, 4.73 (n=13). $F_{2,34}$=.24 and p=.79.

For these subjects there was a significant difference ($F_{2,34}$=11.7, p=.0001) for TAS, the reported test anxiety level. The means were: high-anxious, 9.71 (n=13); truly low-anxious, 9.00 (n=11); repressors, 4.54 (n=13). Newman-Keuls multiple comparisons

found both the truly high and truly low groups different from the repressors at the .05 level.

The correlation between student perception of comps climate (Student Climate) and performance for all subjects was .36 (.95CI=.60,.06), significant at the .01 level. That is, greater comfort by the student was reported with higher performance levels. Conversely, more anxiety was reported by those with poorer exam performance. The correlation between Student Climate and TAS, r=-.46 (.95CI=-.68,-.16), was also significant at the .01 level. In this case, higher test anxiety was associated with greater discomfort during the exam. The correlation between Student Climate and colleague judged Committee Climate was .12 (.95CI=-.21,.42), not statistically significant.

In further exploration of the relationships between test anxiety and performance age was found to be significantly negatively correlated to performance, r=-.49 (.95CI=-.69,-.21), $p \leq .001$. Stepwise multiple regression analysis revealed that age accounted for 23% of the variance in performance. Student Climate was the second and only other variable to enter the regression equation and accounted for an additional 11% of the variance.

Potential differences among the subjects with different anxiety types was further evaluated. With the repressors removed from the data set, the correlation between test anxiety and performance, r=-.47 (.95CI=-.72,-.05), $p \leq .01$, was significant and the correlation between Student Climate and performance was no longer significant (although approximately the same value).

Summary of Findings:

When all anxiety types are pooled, performance on oral comprehensive examinations for a group of masters students in nursing was negatively correlated to students age (r=-.49) and positively correlated to the students comfort as reported just after the completion of comps (r=.36). The correlation between self-assessed test anxiety and performance was not significant for the total group but was significant when repressors, subjects who minimize self-reported anxiety, were removed.

There was no significant difference in performance on the oral test among high anxious, truly low-anxious, or repressor subjects. However, repressors reported significantly lower test anxiety than either of the other two groups.

In sum, the strongest relationship found was between age and performance with greater age associated with lower performance. The next strongest relationship was between students' perception of the climate of the exam and performance, with greater comfort associated with higher performance. However, the availability of information

Figure 1. Correlations for Variables

CORRELATION MATRIX: ALL SUBJECTS

	TAS	Performance	Student Climate	Age	Comm. Climate
TAS	-	-.21	-.46*	.23	.16
Performance		-	.36*	-.49**	.35
Stud. Climate			-	-.03	.12
Age				-	-.14

*Significant at the .01 level
**Significant at the .001 level

CORRELATION MATRIX: REPRESSORS REMOVED

	TAS	Performance	Student Climate	Age	Comm. Climate
TAS	-	-.47*	-.49*	.17	-.13
Performance	-	-	.34	-.42	.28
Stud. Climate			-	.05	.15
Age				-	-.28

*Significant at the .01 level

on the student's anxiety type permitted examination of the relationships with a group of students removed who appear to repress their feelings about anxiety. For the remaining group, test anxiety level was correlated with performance and age was the second strongest correlate.

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